

METATRAK[™]

A multi-track recording system
for the alphaSyntauri digital synthesizer.



Syntauri

M E T A T R A K M A N U A L

*****ERRATA SHEET*****

PLEASE NOTE THE FOLLOWING CORRECTIONS:

<u>LOCATION</u>	<u>CORRECTION</u>
Page 6	(Oscillator Offset) 32th tone should be 32nd tone.
Page 33	(CTRL-D) same as above
Page 35	(STEP 5) After the recording is loaded from disk the track master will appear on the screen; type consecutive "RETURNS" until your hear the recording playback.
Page 35	APPENDIX C should be APPENDIX D
Page 36	APPENDIX C should be APPENDIX E

M E T A T R A K M A N U A L

*****ERRATA SHEET*****

METATRAKtm

Users Manual

©1982 Syntauri Corporation
3506 Waverley Street
Palo Alto, California 94306, USA
(415)494-1017

This manual is copyrighted. All rights are reserved. This document may not, in whole or in part, be copied, photocopied, reproduced, translated or reduced to any electronic medium or machine readable form without prior written consent from Syntauri Corp.

Written by: Robin J. Jigour

alphaSyntauritm, alphaPlustm, and Metatraktm, are trademarks of Syntauri Corp.

Apple IItm is a trademark of Apple Computer Inc.

MusicSystemtm is a trademark of Mountain Computer Corp.

Metatrak basic code was compiled using the "Integer Basic Compiler" by Synergistics Software, Renton, Washington.

METATRAK™ TABLE OF CONTENTS

	Page #
I. METATRAK OVERVIEW.....	1
A. General Description.....	1
B. How to use this Manual.....	1
C. Metatrak and alphaPlus.....	1
II. GETTING STARTED.....	2
A. Set-Up.....	2
B. The Screen Display (Live Mode).....	3
C. Instrument Selection.....	4
D. Loading a Preset Master.....	4
E. Commands and Files.....	5
F. Demonstration Recording.....	5
III. PARAMETER CONTROL.....	6
A. Envelopes.....	6
B. Master volume.....	6
C. Oscillator Offset.....	6
D. Vibrato.....	7
E. Pitch Bend.....	7
F. Tuning.....	8
G. FX mods (special effects).....	8
IV. THE SPLIT KEYBOARD FEATURE.....	10
A. Split Keyboard Parameters.....	10
B. Defining a Split.....	11
C. Changing Instruments.....	12
D. Saving or Loading a Split Master.....	13
V. THE RECORDING PROCESS: BACKGROUND INFORMATION.....	14
A. Tape-Based Multi-track Versus Metatrak.....	14
B. The Track Master.....	15
C. Saving or Loading a Track Master.....	17
D. Oscillators, Instruments, Voices and Tracks.....	17
E. The Metronome/Click Track.....	18
VI. STANDARD RECORDING MODE.....	20
A. Using the Track Master in Standard Recording.....	20
B. Recording the First Track.....	21
C. Meta Files.....	22
VII. METATRAK RECORDING MODE.....	23
A. The Track Master in Metatrak Recording.....	23
B. Recording Additional Tracks.....	23
C. Erasing a Track.....	24
D. Punch-in/Punch-out.....	25
E. Fast Forward.....	25
F. Restart.....	26
G. Echo/Repeat.....	26
H. Playback Speed Control.....	26

METATRAK TABLE OF CONTENTS (cont.)

	Page #
VIII. MIX-DOWN / PLAYBACK.....	28
A. The Track Master in Mix-Down/Playback.....	28
B. Playback Reviewing.....	29
C. The Final Production.....	30
IX. CONCLUSION.....	31
X. APPENDIX	
A. Diskette and File Maintenance.....	32
B. Command Quick Reference.....	33
C. File Type Descriptions.....	34
D. Demonstration Recording Instructions.....	35
E. Recording Errors and Warnings.....	36
F. FX Mod Descriptions.....	37

I. METATRAK OVERVIEW

A. General Description

Metatrak is one of the most valuable compositional tools a musician can use: a synthesizer-based multi-track recorder. Metatrak allows you to orchestrate a composition by simultaneously recording numerous performances varying in instrumentation. The end result is a quick and cost effective recording that can be used for compositional arranging, recording studio preparation, background to live performance, or simply for listening pleasure at a later time.

A software upgrade product for the alphaSyntauri[™] digital synthesizer, Metatrak offers a number of features specially geared towards live performance and recording situations:

- * A 16 track synthesizer recording system
- * Conventional recording controls: record, play, erase, fast forward, punch-in/punch-out
- * Independent track control over instrument, vibrato state, and volume
- * Special record modes for sequencing and playback speed adjustment
- * A built-in metronome/click track
- * Split keyboard capability from one to eight splits
- * Compatibility with alphaPlus[™] preset masters (instrument banks)

B. How to use this Manual

This manual describes the proper operation of the Metatrak operating system software. It is divided into nine main sections covering all aspects of the Metatrak system. In addition, the appendix offers additional information which you will find useful. These sections are all referenced in the Table of Contents.

C. Metatrak and alphaPlus

Although not mandatory, you should first get familiar with the alphaPlus operating system before going on to Metatrak. This is important, for much of the fundamental operation is similar and most instruments used in Metatrak are defined in alphaPlus. In fact, the two software packages should be used in conjunction. Think of alphaPlus as your instrument development software and Metatrak as your advanced performance and recording software. The combination of the two make the alphaSyntauri system a powerful general purpose synthesizer

II. Getting Started

II. GETTING STARTED

A. Set-Up

Metatrak software must be used with the alphaSyntauri synthesizer system (see Figure 1). The system configuration for Metatrak includes the following components:

- * Metatrak (V1.0) operating system software on Floppy diskette
- * AlphaSyntauri interface card, cable and five octave keyboard
- * Mountain Hardware MusicSystemtm cards
- * Apple IItm or Apple II Plus 48K RAM computer with 16K RAM card (not ROM card)
- * Disk II disk drive and controller card
- * Video monitor (or TV with RF MOD)
- * Analog control paddles
- * Audio system or headphones

In addition to the above list, the alphaPlus software and any diskettes containing preset masters will be useful if instrument sounds are to be modified. Also, have an extra diskette handy for storing recordings (see Appendix A for instructions on initializing a new disk). Before using Metatrak be sure to MAKE A BACK-UP COPY of the Metatrak diskette (see Appendix A for instructions on copying diskettes).



Figure 1: The alphaSyntauri Synthesizer System

II. Getting Started

To begin, follow the set-up procedure for the alphaSyntauri system as explained in the alphaSyntauri users manual. Once correctly set-up, insert the Metatrak software diskette into the disk drive and turn on the power switch of the Apple. This will "boot-up" the Metatrak software. Make sure your audio system volume is down until the boot-up is completed.

During boot-up a Metatrak set-up display will appear showing default conditions for initial preset master, master volume and card slot positions (see Figure 2). Make sure that these conditions correspond to the way your alphaSyntauri is set up; specifically, the slot numbers of the Syntauri interface card (set for slot 2), and Mountain Hardware MusicSystem cards (set for slot 4 and 5; make sure the card with the audio cables is on the left side). If your configuration varies from this, make the appropriate changes as asked below the set-up display. Note, once properly configured, the set-up program can be bypassed for future boot-up (see Appendix B).



Figure 2: Set-up Screen Display

B. The Screen Display (Live Mode)

Once the Metatrak diskette has completed boot-up, the "live" mode screen display will be seen as shown in Figure 3. Playing any notes on the keyboard will cause a response both audibly and visually.

The upper portion of the screen dynamically displays each note played with a rectangular bar. The bars are arranged horizontally in octaves of C. Besides having a hypnotic effect, the display is useful for analyzing keyboard technique. It also helps keep track of the total number of simultaneous notes while recording (this is covered in more detail in the recording sections of this manual).

II. Getting Started

On the lower portion of the screen are various parameters for Metatrak live mode, including: current instrument name, split instrument status, vibrato and master volume controls. (Detailed usage of these parameters will be covered in their applicable sections).



Figure 3: Metatrak "Live Mode" Screen Display

C. Instrument Selection (0-9,U)

Any one of the ten instruments in the current "preset master" can be selected as with alphaPlus. Type any number between 0 and 9 on the Apple to change the entire keyboard to a new instrument. In Metatrak, instruments can be changed instantly whereas it takes approximately one second with alphaPlus.

By typing the "U" key, the name of the instrument will be updated on the screen. Besides the instrument name the "U" key updates other parameters on the screen which are covered further in this manual.

D. Loading A Preset Master (CTRL-P,?)

As referred to earlier, a preset master is a bank of ten instruments that can be created using the alphaPlus software. In Metatrak, one preset master can be resident at a time. A new preset master can be loaded by holding down the "CTRL" key while typing "P". Doing this will cause a prompt to appear asking for the name of the preset master that is to be loaded from disk:

"LOAD PRESET MASTER:"

Enter the preset master name followed by "RETURN". Loading a preset master that was created with software previous to alphaPlus (V2.0) will cause an error stating "LFO MASTER NOT FOUND". This will not prevent the preset master from being loaded. (See Appendix E for more information on this subject.)

II. Getting Started

To examine the contents of a diskette for loading a preset master, type "?" any time during live mode or at the first letter of a preset master load. The actual preset master name on the diskette will be preceded by "PRESET MASTER:". Included on the Metatrak diskette are two preset masters named; METATRAK.L and ALPHA PLUS. As specified in the set-up program, METATRAK.L is automatically loaded from boot-up.

E. Commands and Files

Similar to using the CTRL-P "command", to load a preset master "file", there are many other commands and files used throughout Metatrak. A list describing all Metatrak commands is provided in Appendix B, and file type descriptions are covered in Appendix C. Reviewing both these sections will help to give you a general perspective of the Metatrak software and serve as a quick reference guide once you understand its operation. More detailed descriptions of Metatrak commands and file types are covered in applicable sections of this manual.

F. Demonstration Recording

A Metatrak demonstration recording is provided on your Metatrak diskette. Listening to it will give you an idea of the capabilities and potential Metatrak offers. To hear the demonstration recording, follow the step by step instructions in Appendix D. After you are through listening, resume reading the manual to learn how to properly use Metatrak for your own recordings.

III. Parameter Control

III. PARAMETER CONTROL

Although actual sound development of an instrument is done using alphaPlus, Metatrak provides control over many parameters specifically needed in a performance or recording situation.

A. Envelopes (E,L)

As in alphaPlus there are two types of envelopes, linear and exponential. Exponential envelopes tend to be more effective when defining keyboard instruments, whereas linear has a smoother attack that works best for orchestral instrument sounds. Selection of either type should be done when defining the original sound in alphaPlus.

By default, an entire preset master will be set to exponential unless the preset master name has a ".L" in it. For example, a preset master called "STRINGS.L" will automatically select linear envelopes immediately after loading.

Envelope type can also be changed by typing "E" for exponential envelopes or "L" for linear while in live mode. In doing this the master volume will be adjusted to compensate for the apparent difference between the two envelope types.

B. Master Volume <- ->

Master volume of all instruments can be dynamically controlled using the left and right arrow keys on the Apple keyboard. Typing the "<-" key lowers system volume by 5. Typing the "->" key raises system volume by 5. The range of the master volume is from 0 to 255.

The master volume is shown on the screen display when in live mode by "VOL". The current volume, as adjusted by the arrow keys, can be updated on the screen by typing "U" for update. The value upon boot-up will be whatever the master volume is set at in the set-up procedure. The standard setting is 127 for exponential envelopes which automatically adjusts to 42 for linear.

C. Oscillator Offset (CTRL-0)

Each instrument uses two oscillators, one for the primary channel and one for the percussion channel. In Metatrak, the frequency offset between the channels of each instrument can be set by holding down the "CTRL" key and typing the "0" key. The following prompt should appear:

"SET OFFSET: 2"

The current offset for the instrument will be shown. A new offset is selected by entering a number between 0 and 255. If the offset is not to be changed simply type "RETURN". The offset value corresponds to 32th tone increments applied to the percussion channel. A value of zero will give no offset. By slightly offsetting the frequency with a value of 1 or 2, the sound will

III. Parameter Control

usually become much richer and full. In some cases setting the offset for tonic intervals such as a fourth (80), or fifth (112), can be effective making each note sound like a chord. A value of 192 causes an octave of offset.

Even though offset can be set in Metatrak, the actual change cannot be saved. This must be done by defining and saving the preset master in alphaPlus (V2.0).

D. Vibrato (O,V,CTRL-V)

Vibrato rate, "VIR", and vibrato depth, "VID", are shown on the screen while in live mode. By typing "U", the current instrument vibrato rate and depth will be updated on the screen. To instantly turn off the vibrato, type the "0" key. Re-typing the instrument number will reinstate the instrument's vibrato.

Although each instrument in live mode has its own individual vibrato rate and depth settings, only one vibrato (frequency LFO) exists in the operating system. Thus, when using multiple instruments as with Metatrak recording or with split keyboard, the current vibrato setting displayed is shared by all.

Vibrato rates or depths can be modified. One method of doing this is by adjusting the analog control paddles and sampling their position by typing "V". Another way is by first holding down the "CTRL" key then typing "V". This will cause the following sequence of prompts to appear:

"LOAD VIBRATO WAVE: SINE"

Here, the vibrato modulation waveform may be changed to a new waveform called from the diskette. To leave as is type "RETURN". The next prompt will be:

"VIBRATO RATE: 21"

The current vibrato rate will be shown. To change, type in the new value followed by "RETURN". If no change is to occur simply type "RETURN". The last prompt displayed is:

"VIBRATO DEPTH: 3"

Changing depth is handled as with vibrato rate. Again, typing "RETURN" will cause the displayed value to be used. After this sequence, the system will return to live mode. The new vibrato values selected will replace the current instrument's vibrato values. Note, like offset, vibrato settings will not be permanent unless the preset master is defined and saved using alphaPlus.

E. Pitch-Bend (CTRL-B)

Metatrak has a built-in pitch-bend control as opposed to being implemented in an FX mod as with alphaPlus. The pitch-bend feature can be accessed by holding down the "CTRL" key while typing "B". Doing this will allow pitch control through the analog control paddle 0. When pitch-bend is selected a "PB" will appear on the screen to the right of "VOL".

III. Parameter Control

Pitch-bend is normally used by controlling the paddle with one hand using your thumb, while playing the keyboard with the other. Pitch-bend is only applied to the live keyboard instrument and it cannot be recorded. To turn pitch-bend off type "CTRL" "B" again.

F. Fine Tuning

The alphaSyntauri keyboard in Metatrak is tuned to A=440HZ in an equal tempered scale. If it's necessary to change the fine tuning, the alphaSyntauri tuning can be modified with the "scale update program".

To use the scale update program, quit Metatrak by pressing the spacebar from live mode, then type "Q" followed by "RETURN". By doing this the basic prompt "]" should appear. Make sure the Metatrak diskette is in the disk drive, then type "RUN SCALE UPDATE" followed by "RETURN".

After the program is loaded from disk, a prompt will appear on the screen specifying the current frequency of A above middle C. To change the value enter the new frequency in HZ followed by "RETURN". Note: for reference, when A=440HZ, A flat=415HZ and B flat=466HZ.

After selecting the frequency, a prompt will appear for specifying intervals per octave. Standard equal tempered scale is twelve intervals per octave. In Metatrak, any value from one to fifteen intervals per octave can be selected. If this is not to be changed, simply type "RETURN". The scale update program will then load and run Metatrak again.

Note that pitch-bend can also be used as a fast, though temporary, method of tuning to raise the pitch in 32nd tones. Pitch-bend, however, will only affect the live keyboard; tuning of recordings will stay as specified in the scale update program.

Coarse tuning for transposition of key or octaves can be controlled within the instrument definition by using alpha plus.

G. FX Mods (CTRL-F)

The Metatrak software has a special feature that allows "FX mods" to be loaded off diskette and into the main program loop. FX mods are small assembly language programs that serve specific functions for sound modification.

There are several FX mods available on the Metatrak diskette for immediate use. The FX mods included are individually described in Appendix F. Future software releases from Syntauri will include additional FX mods for Metatrak. An FX mod can be loaded by holding down the "CTRL" key while typing "F". A prompt will appear:

```
"MFX MODE
L)OAD, S)AVE OR O)FF:"
```


III. Parameter Control

By typing "L" the following prompt will appear:

"LOAD MFX MOD:"

Type the name of the FX mod desired followed by "RETURN". (Note: the "M" in MFX is to distinguish a Metatrak FX mod from an alphaPlus FX mod. The two file formats are different and cannot be mutually used.) After the FX mod is loaded another prompt will appear:

"LOWEST TRACK:"

Enter the lowest track number, (0-16) followed by "RETURN", that is to use the FX mod. By simply typing "RETURN", the track assignment will default to the track number already in the FX mod. (To fully understand the implications of this prompt, you must become familiar with the track master, explained in section V. Not all FX mods can be assigned to a track region, see Appendix F.) A final prompt in this sequence will then appear:

"HIGHEST TRACK:"

Similar to the preceding prompt, enter the highest track number, (0-16) followed by "RETURN", that is to use the FX mod. The combination of these specifications sets up a region of tracks that use the FX mod. Those tracks outside of the region are left in their normal state. After this the system will return to live mode.

Control of Fx mods varies, some may be fixed, others allow their parameters to be modified through the analog control paddles. Once a modifiable FX mod is set to your liking, its state can be saved along with the track region assigned to it. To do this hold down the "CTRL" key while typing "F", as explained earlier for loading an FX mod. This time, however, type "S" for save FX mod. The following prompt will appear:

"SAVE MFX MOD:"

By typing a new name for the FX mod, followed by "RETURN", the current state of the FX mod will be saved to disk for later use.

To turn off any FX mod hold down "CTRL" and type "F" again, then type "0" followed by "RETURN". After turning the FX mod off the system will go back to live mode.

IV. The Split Keyboard Feature

IV. THE SPLIT KEYBOARD FEATURE

Metatrak has a powerful split keyboard capability that allows the alphaSyntauri keyboard to be sectioned with a different instrument assigned to each. Up to eight sections can be defined.

The split keyboard feature is very effective for a live performance. For example, the lower two octaves might be set for bass guitar while the upper octaves could be set for strings. Using the split in conjunction with recording makes it possible to record then play back a repeating background line while playing a few different instruments live in split mode on the keyboard.

The following sections provide information on defining a split, changing instruments in a split, and saving or loading a split master via disk.

A. Split Keyboard Parameters

Looking at the video display while in the live mode you will see various parameters on the lower portion of the screen (see Figure 4). Those specifically associated with split keyboard are in the top line. The parameters are defined as follows:



Figure 4: Live Mode (without keyboard split)

"0"

Shows that the only instrument in use is instrument number 0. Since only one number is displayed the keyboard isn't split. When two numbers are displayed there are two instruments in split mode at the keyboard, and so on up to eight numbers and eight splits.

IV. The Split Keyboard Feature

"SIP: 1"

Shows that the "Split Instrument Pointer" is set to 1. Since only one instrument is currently defined, a numeric key (between 0 and 9) struck on the Apple will change the instrument for the entire alpha keyboard. Please remember that you must type "U" to update the video screen display when you change instruments.

"BELLS/FEEDBACK"

Shows the name of the current instrument being pointed at by SIP. As previously mentioned "U" must be typed to update the screen for current status.

B. Defining A Split (CTRL-S)

Defining a split keyboard can be accomplished by holding down "CTRL" while typing "S". The following prompt will appear:

"SPLIT MASTER MODE
(L)OAD, (S)AVE OR (D)EFINE WHICH:"

To define a split type "D" followed by "RETURN". Next, a prompt will appear that asks to specify the number of splits to be used:

"NUMBER OF SPLIT INS. (MAX=8)"

For demonstration purposes, type "2". The next prompt will ask you to set the position of the split on the keyboard:

"HIT KEY FOR SPLIT POINT #1"

You can now set a split point by pressing the key on the alphaSyntauri keyboard where you want the split. Again, for demonstration purposes press a key somewhere in the middle of the keyboard. Immediately after this is done a list of all the instruments in the preset master will be displayed on the screen (see Figure 5). Below the list a prompt will ask you to assign an instrument number to a split position:

"ENTER SPLIT INSTR. #1"

Typing an instrument number will assign the corresponding instrument to the left most split. For example, type 7. The prompt will then update for assigning the next split instrument; type 5. After instrument selection the alphaSyntauri will be back in live mode. By playing the keyboard you will hear the two instruments divided by the split. Looking at the screen (Figure 6) you should also notice changes in the split keyboard parameters.

IV. The Split Keyboard Feature



Figure 5: Preset Master list for assigning instruments to splits



Figure 6: Live Mode with a split of two instruments

"7 5"

Shows there are two instruments on the alphaSyntauri keyboard. Instrument #7 is on the lower portion and instrument #5 on the upper portion.

"SIP: 1"

Shows that the split instrument pointer is now set for controlling the lower split instrument. Typing a key between 0-9, will change the lower instrument.

"BASS GUITAR 2"

This shows the current instrument name of the split pointed at by SIP.

IV. The Split Keyboard Feature

The preceding was a basic run through of defining a split keyboard. As you can see it is very straight forward and the more practice you get the simpler it will become. Try setting up all eight splits with instruments 0-7! To reset the keyboard back to one split, define a split of one and hit the uppermost key for the split position.

C. Changing Instruments (J,K,0-9,U)

Once a split is defined, it is possible to change the instruments associated with a split while in live mode. This is done by controlling the SIP. The number specified by SIP is the number of the split that can currently have its instrument changed. For example, if SIP=2 and there were four splits, then the second from the left split can have its instrument changed by typing a number (0-9).

To control SIP the "J" and "K" keys on the Apple are used. Typing "K" increments SIP by one. Typing "J" decrements SIP by one. (Notice that it isn't necessary to type "U" to show the current state of SIP.)

With a keyboard split of two, typing "K" will allow the upper split to be controlled, typing "J" will allow the lower to be controlled. If the instrument or SIP is changed, the correct instrument name will only be displayed by typing "U".

D. Saving or Loading a Split Master (CTRL-S,?)

Because some split keyboard definitions can become quite complex, Metatrak provides the capability for saving and loading a split master. The split master contains all the specifications for a given split keyboard definition.

To save a split master to disk, hold down the "CTRL" key while typing "S". When the prompt appears for load, save or define, type "S" for save. Next a prompt will appear:

"SAVE SPLIT MASTER:"

Type the name for the current split followed by "RETURN". Associating the split master name with the musical piece and preset master it is used with, will serve as a reminder for later use. After the split master is saved to disk, live mode will be reinstated.

Loading a split master is handled in the same fashion. When selecting the split mode type "L" for load. The following prompt will appear:

"LOAD SPLIT MASTER:"

Enter the name of the split to be loaded from disk followed by "RETURN". Remember, typing a "?" while in live mode or before entering a file name for load or save, will display the contents of the diskette.

V. The Recording Process: Background Information

V. THE RECORDING PROCESS: BACKGROUND INFORMATION

A powerful compositional tool, the Metatrak record feature additively combines multiple recorded performances for simultaneous playback. Take for example, the creation of a composition consisting of three different instrument parts; bass guitar, electric piano and flute. Using Metatrak the bass guitar could be recorded first. Once completed, the recording is played back and listened to while simultaneously recording the electric piano. Similarly, the flute can be added while listening to the two earlier recorded parts. The result is a quick and cost effective recording which may be used for compositional arranging, recording studio preparation, background to live performance, or simply for listening pleasure at a later time.

The process of recording with Metatrak is broken down into three categories:

- * Standard Recording - Used to lay down the first track.
- * Metatrak Recording - Used for adding subsequent track recordings while listening to earlier ones playback.
- * Mix-Down/Playback - Used for the final review and adjustment of all track parameters.

Compared with tape based multi-track recording techniques, this process is respectively analogous to "record only", "sync" and "playback only" modes.

The following sections cover these three categories and how they work in conjunction with the "track master". In addition, a comparison with tape based multi-track recording is made and other important aspects of Metatrak are discussed. For a demonstration of a Metatrak recording, see to Appendix D.

A. Tape Based Multi-track Versus Metatrak

With Metatrak, each recording is associated with an individual track number of which there are sixteen available. The term track comes from conventional tape based multi-track recording where record/playback control over each track is accomplished by electromagnetically dividing the tape into multiple parallel sections. Each section has its own erase, record and playback heads.

Multi-track recorders started making their appearance in the late 1960s when half track (stereo) and quarter track (4 track) were commonly used. Now it is common place for recording studios to have a number of multi-track recording systems consisting of 2, 4, 8, 16 or 24 tracks.

There are similarities and differences between a tape-based multi-track recorder and Metatrak. Both methods of recording have their particular advantages but should not be confused as being the same. Similarities are the provision of standard multi-track recording features such as: record, playback, erase, fast forward, punch in/punch out, click track and track parameter control.

A major difference between the two methods, however, is that a tape based recording system is capable of recording virtually any audio sound, including

V. The Recording Process: Background Information

various acoustic instruments and vocals. Metatrak exclusively records sounds played on the alphaSyntauri keyboard. Because the alphaSyntauri implements recording digitally, it provides features and capabilities not possible on conventional tape based systems. Such features and capabilities include: changing instrumentation of an already recorded piece, playback speed adjustment without pitch change, and special sequence recording modes. Combining standard multi-track capabilities with special recording features, Metatrak proves an effective compositional tool.

B. The Track Master (CTRL-R)

Before starting to record, you should understand the concept and use of the track master. As compared to a tape based multi-track recorder, the track master acts as the control console and interconnection to the instrument being recorded. It provides all the information for assigning an instrument and controlling parameters of a given track. Its specific use and access depends on what function is being implemented, whether it be standard recording, Metatrak recording or mix-down/playback.

The track master can be accessed for viewing in live mode, by holding down the "CTRL" key while typing "R". In doing this a track master display will appear on the screen looking similar to figure 7. Looking at the display you can see that each of the sixteen tracks, plus the live keyboard (track 0) are listed vertically at the left side of the screen. Each track has associated with it a "field" for instrument number, instrument name, record status, vibrato status and volume. Below the track master display is the prompt:

"CHANGE VALUES FOR TRACK NUMBER:"

This allows you to change the track master. For now, though, let's just review the functions of the track master (detailed explanations are covered later).



TRK	INS	NAME	RSTAT	VIB	VOL
0	KBD				
1	BASS	GUITAR			
2	DRUM	DRUM			
3	TRM	TRM			
4	TRM	TRM			
5	TRM	TRM			
6	TRM	TRM			
7	TRM	TRM			
8	TRM	TRM			
9	TRM	TRM			
10	TRM	TRM			
11	TRM	TRM			
12	TRM	TRM			
13	TRM	TRM			
14	TRM	TRM			
15	TRM	TRM			

CHANGE VALUES FOR TRACK NUMBER

Figure 7: The Track Master

Instrument Number and Name

The instrument field of the track master (as shown in figure 7), defines which of the ten instruments of the current preset master is assigned to a track. The assignment is controlled by the instrument number. Each track doesn't have to be different. A single instrument can be assigned to more than one track. Note that the instrumentation specified by the track master is dependent on the current preset master. Thus, to achieve the original orchestration in later playbacks, the preset master and track master used in the recording must be loaded. Loading and saving a track master is covered further in this section.

Record Status (RSTAT)

The "RSTAT" field in the track master specifies the current mode of operation for a given track: playback, record or erase. When accessed in live mode or during playback, "RSTAT" for all tracks will be set to "PLA" for playback. In standard recording the "RSTAT" field may also specify "REC". In Metatrak recording all modes are possible: "PLA", "REC" and "ERA" (for erase). Only one track can be set to "REC" at a given time.

Vibrato Status (VSTAT)

A vibrato status field, "VSTAT", is provided for turning vibrato on or off for each track in each. Although each instrument in live mode has its own individual vibrato setting, only one vibrato (frequency LFO) exists in the operating system. Thus, when using multiple instruments, as in Metatrak, the vibrato setting is that of the current keyboard (track 0) instrument. Using "VSTAT" the global vibrato can be selectively applied. When "VSTAT" is set to 1, vibrato is applied. When set to 0, it is off.

Volume (VOL)

The last parameter field in the track master is volume, "VOL". The "VOL" setting is used especially in mix-down/playback to bring out or subdue specific instruments relative to one another. The volume range is from 0 (off) to 255 (full on). Unlike the master volume which is absolute and completely linear. The "VOL" setting is actually a limit for the maximum volume of an instruments amplitude envelopes. It has a similar effect to lowering or raising the PV, AV and SV envelope parameters in alphaPlus.

Two things should be kept in mind when using "VOL". First, being a limit control rather than absolute volume, "VOL" will only affect volume if set below the envelope volumes as defined with alphaPlus. If set above, the instrument will stay as it was originally defined. Second, the overall adjusting effect will be different with linear envelopes as opposed to exponential. If linear envelopes are used "VOL" will respond in a linear fashion. If exponential envelopes are used, "VOL" responds exponentially.

V. The Recording Process: Background Information

C. Saving or Loading a Track Master (CTRL-T,?)

The track master is an integral part in the recording and playback process. Because it will vary from recording to recording, a provision is made for saving and loading a track master via disk. With this capability a complete multi-track recording can be worked on and then saved with all the track master settings accessible at a later time. Saving or loading a track master is done in live mode by holding down "CTRL" and typing "T". A prompt will appear:

```
"TRACK MASTER MODE
L)OAD OR S)AVE      WHICH:"
```

Typing "L" followed by "RETURN" will select the loading of a track master from disk. Typing "S" followed by "RETURN" will select the saving of the current track master to disk. Once either is selected a prompt for typing the track name will appear. Enter the appropriate name followed by "RETURN". After the disk is accessed, live mode will be reinstated.

As mentioned earlier, typing "?", in live mode or at the first letter position of a file load or save, displays diskette contents. This allows viewing for track master file names which are preceded by, "TRACK MASTER:".

D. Oscillators, Instruments, Voices and Tracks

Understanding the relation between oscillators, instruments, voices and tracks, will help you in preparation and creation of a good Metatrak recording. These four entities can easily be confused at first; however, each one serves an individual function. The following is a brief description of each:

Oscillators

Digital oscillators are the waveform sound source for the alphaSyntauri synthesizer. There are a total of sixteen available for use.

Instruments

Instruments are preset sounds defined using the alphaPlus software. Each has information for controlling two oscillators per voice. Instruments are loaded into Metatrak as a preset master, a bank of ten instruments.

Voices

A voice is a single active instrument sound. Each new note played activates a voice. Since, each instrument definition controls two oscillators, each voice uses two oscillators. Having sixteen oscillators available, up to a total of eight voices can be active simultaneously.

Tracks

A track is the means for associating notes being recorded with a specific instrument. There are sixteen tracks available for recording, (not to be confused with sixteen oscillators). Any track can have any instrument in the preset master assigned to it.

V. The Recording Process: Background Information

To summarize the above descriptions in reference to Metatrak: You have sixteen tracks available for recording. Each track can have any of ten instruments in the preset master assigned to it. Up to eight voices can occur simultaneously among all the tracks.

Considering the fact that only eight voices are available, you might wonder, "Why have sixteen tracks?" The voice limitation is eight "simultaneous" voices. This does not mean only eight instruments can be used throughout a piece. Thus, it is possible to have various instruments with different track settings, (volume, vibrato, FX mods), occurring at different places within a Metatrak recording as long as no more than eight occur simultaneously. If eight voices are exceeded, the voice with the lowest volume will be removed. The live screen display can prove useful for seeing how many voices are active at a given time.

Selecting instruments can play a very important part in the final outcome of a Metatrak recording. There are a number of preset masters available within the alphaSyntauri synthesizer software library. These preset masters may serve your initial recording needs, or you may choose to create instruments yourself using alphaPlus. Besides considering general orchestration among tracks, certain defined characteristics of an instrument will have an effect on the recording. This is especially the case with envelope parameters.

If an instrument's envelope has a long release time (the note sustains after releasing a key), it is easy to use many voices in a short period of time. Consider the situation of playing one note at a time quickly up the keyboard. If the release time was lengthy, all of the eight possible simultaneous voices could be used, even though only one key was struck at a time. This occurs because an oscillator pair will stay assigned to each sustaining voice.

To maximize the number of voices available at a given time, it is best to use shorter envelope release times. Doing so will prevent clipping of notes (turning off an active voice for a new one), in case the maximum number of simultaneous voices is exceeded. If a particular instrument needs a long release time at a certain point within a recording, use the sustain pedal to accomplish this so it can be turned on or off as needed.

E. The Metronome/Click-Track (CTRL-Z)

Since Metatrak recording is an accumulative process of recording a new track while listening to previous ones, the most important recording is the first. This is especially the case for timing. To assist in recording a good first track, in perfect timing, Metatrak provides a "metronome/click-track".

The metronome/click-track is a visual and audible assistant used while playing music at a specific tempo. Although its primary function is assisting in recording a first track, it also can be used as a timing marker for subsequent tracks, or just for practice in live mode.

V. The Recording Process: Background Information

The metronome/click-track can be accessed from live mode by holding down "CTRL" and typing "Z". In doing this, a prompt will appear asking to set the tempo at a value of 0 to 280 beats/minute.

"SET METRONOME TEMPO (0-280);"

To set a tempo, type in the desired value followed by "RETURN". A value of "0" turns the metronome/click-track off. After set, the system will return to live mode with both visual and audio feedback.

For visual indication a rectangular block alternating from one side of the screen to the other will appear. Simultaneously, an audible click will be heard coming from the speaker inside the Apple. In addition, the metronome/click-track signal is sent to the cassette output connector on the back of the Apple. This allows for further audio amplification by connecting a cable from the output to your audio system.

Note the metronome/click-track should not be used with the "echo/repeat" feature in Metatrak record mode (see section VII, echo/repeat feature).

VI. Standard Recording Mode

VI. STANDARD RECORDING MODE

Standard recording in Metatrak is used for recording the first track of a multitrack piece, or simply for laying down a single track. It is very similar to recording in the alphaPlus operating system software using the record/playback menu to control the recording process. A major difference, though, is in the assignment and control of one of sixteen tracks for recording. As mentioned earlier, this function is accomplished through the track master.



Figure 8, The Record/Playback Menu

A. The Track Master In Standard Recording

The track master is accessed in standard recording in-line with the recording process. To start a recording, the record/playback menu must be called by pressing the space bar in live mode (see figure 8). To select standard recording type "R" followed by "RETURN". At this time the track master display will appear on the screen.

At any given time only one track can be in record mode. The track showing "REC" in its "RSTAT" field, is the current recording track. All other tracks are set to playback, "PLA", even though they are not in use. Below the track master display is the prompt:

"CHANGE VALUES FOR TRACK NUMBER:"

If the current state of the track master is acceptable, simply hit "RETURN" to continue into the recording process. If you wish to change the assigned instrument, record status, vibrato status or volume of a track, type the number of the track you wish to change followed by "RETURN". Although not mandatory, for organization sake, it is usually best to use track number "1" for your first recording.

VI. Standard Recording Mode

After responding to the prompt with a track number, a cursor will appear at the instrument number of the track. To change the instrument, type the new instrument number followed by "RETURN". Notice this will also update the instrument name. If the instrument is not to be changed, hit "RETURN" to step to the next field.

The next field encountered is "RSTAT" (record status). If you wish to use this track for your first recording and "RSTAT" is already in record, simply hit "RETURN". If not, type "R" and the status will update to record mode, "REC".

Hitting "RETURN" will move the cursor to "VSTAT" (vibrato status). Vibrato status is a switch that can restrict or apply vibrato to a track. To change, enter the desired value (1=on, 0=off), followed by "RETURN". Again, if no change is required, hit "RETURN".

The last field is "VOL" (track volume). To change, enter the desired value (0-255) followed by "RETURN", or just hit "RETURN" to leave as is. At this point the following prompt will appear again:

"CHANGE VALUES FOR TRACK NUMBER:"

If the track master is set up correctly, hit "RETURN". If not, follow through as explained previously.

B. Recording The First Track

Once the track master has been set for recording your first track, the record/playback menu will again be displayed. From this point on the general recording techniques of alphaPlus are applicable. Hitting "RETURN" will put the system in live mode with the instrument name in reverse video (signifying record), and the track number being recorded displayed by "REC:". The actual recording will not start until a key or pedal is depressed. (Note: The sustain and portamento pedals are also recorded). At this time the metronome/click track, "CTRL-Z", can be set if desired (see section V for more information on the metronome/click track).

As explained in section V, the metronome/click track can be used for keeping tempo or to serve as a guide for future tracks. Although the metronome/click track will serve most purposes, at times you may also want to use the first track as a "click track recording". Its primary purpose is to serve as a guide for later tracks. A click track recording will usually last the entire duration of the recording and sometimes use many voices. Once all other tracks are added, the original click track can be erased. If you choose to approach recordings in this fashion, the instrument used should be defined in alphaPlus with envelope peak and sustain values that are relatively low compared to the other instruments. This way, even if too many voices are played the click track recording will disappear first.

It is important to remember when laying down your first track not to use too many voices. That is, playing many notes simultaneously. A maximum of eight notes (voices) can be active at a given time for all track recordings. Being conservative will free up voices for later tracks. Effective use of voices is covered in section IX.

VI. Standard Recording Mode

Another type of first track recording is the "dummy track". A dummy track is basically recorded time elapsing, without keyboard input. It can be used when you are not interested in following a first track recording while adding subsequent tracks. An example of this might be a composition that changes instrumentation sequentially from beginning to end. To record a dummy first track, simply press one of the footpedals down and up once, then let the system record time for as long as the expected duration of the piece. For example, if the length of the total piece was around five minutes, record the dummy track for five minutes then terminate the recording and save it to disk.

To terminate any type of recording press the SPACEBAR. If you are satisfied with the recording for your first track, save it to diskette from the record/playback menu by typing "S" followed by "RETURN". A prompt will appear:

"RECORDING COMPLETE:"
NAME TO SAVE:

Type the name you wish to give the recording (not to exceed fourteen characters), followed by "RETURN".

If you wish not to save the recording, but rather start over, reset the record buffer to the beginning by typing "B" followed by "RETURN" in the record/playback menu.

Other standard functions of the record/playback menu can also be useful in assistance to the recording process. Playback of the recording is accomplished by typing "P" followed by consecutive "RETURN"s until heard. The echo feature, "E" followed by "RETURN", will allow a sequence repeating of the recording after terminated by the spacebar. If a recording that was saved to disk needs to be reviewed, the load function can be selected by typing "L" followed by "RETURN".

C. Meta Files

The length of a recording is measured by the total number of notes recorded and stored in memory. This is specified in the record/playback menu whenever a recording is terminated. The maximum number of notes allowed in basic Metatrak is approximately 3000 notes (see Appendix E for recording errors and warnings). Future product releases from Syntauri will expand the number up to 20,000 notes. The length of a recording relative to time, will depend on how quickly or slowly the notes are played.

In Metatrak the actual recording saved or loaded from the disk is called a meta file. A meta file is not compatible with previous alphaSyntauri operating system recordings, called note files. Thus, recordings saved as note files cannot be loaded into Metatrak and vice versa. The primary difference between the two file types is that Metatrak stores track information in a command byte format. A note file does not contain any track information.

VII. Metatrak Recording Mode

VII. METATRAK RECORDING MODE

As explained earlier, Metatrak recording is the process of recording new tracks while listening to previously recorded tracks in playback. Sixteen tracks are available for recording, using any of the ten instruments of the preset master. Metatrak also has special recording operations for sequencing and adjusting the speed of tracks in playback. Additionally, many common tape-based recorder controls such as; track erase, punch in/punch out, and fast forward, are included.

Entering the Metatrak record mode can be accomplished from the record/playback menu by typing "M" for Metatrak followed by "RETURN". A prompt will appear stating:

"LOAD META FILE:"

Type the name of the meta file to be worked with followed by "RETURN". The meta file can be a first track recording or a previously worked on Metatrak recording. As additional tracks are being added, the meta file loaded will be updated unless you change the name during the Metatrak process.

A. Using The Track Master In Metatrak Recording

Once the initial meta file is loaded the track master display will appear on the screen. Control of and access to the track master is handled as in standard record mode. The first step in Metatrak record mode is to select the next track for recording. If only one track, (a first track recording), was loaded chances are track 1 will be the track currently in record mode. As in the standard record mode, one track will always be set to record. To update the current record track follow through with the prompt sequence as with standard recording, section VI.

B. Recording Additional Tracks

Once the track master is set up as desired, actual Metatrak recording can begin. Two prompts will appear after leaving the track master display. The first one will state:

"ECHO/REPEAT (Y/N):"

This allows the echo/repeat feature to be used. The default for this feature is "NO". For now, simply hit "RETURN". The second prompt will appear:

"PLAYBACK SPEED (1-800%):100"

The default for this feature is normal speed (100%). For now, also hit "RETURN". Both these special features will be covered in more detail later.

At this point the system should be back in live mode, ready to record a new track while earlier recorded tracks are in playback. The instrument heard from the keyboard will be the instrument assigned to the current record track. The current record track number is indicated on the screen by "REC:". Whatever is

VII. Metatrak Recording Mode

played on the keyboard will be recorded in sync with the previous recordings. Note, the lower right side of the screen displays "METATRAK" as an indication of being in Metatrak record mode. At any time during recording "CTRL-R" can be used to change the track master or simply to pause (this will not effect the timing).

The recording can be terminated in two ways. The first is to let the previously recorded track complete playback. The second is to press the SPACEBAR at any given time during the process. Either method of termination will allow the option of saving what was recorded or disregarding it and starting over. The prompt that appears after pressing the SPACEBAR is:

"SAVE THIS TRACK (Y/N)?"

If "Y" is typed, the following prompt will appear:

"SAVE AS FILENAME:"

The name of the meta file loaded last will appear after the prompt. If you wish to keep the same name, simply type "RETURN". To change the name, type in a new name followed by "RETURN". IN EITHER CASE, THE newly recorded track combined with the earlier tracks will be saved to disk as a meta file. If the track is not to be saved, hit "RETURN". Either choice or originally typing "N" to "SAVE THIS TRACK" will encounter the prompt:

"Q)UIT OR M)ETA"

Now, if additional Metatrak recording is to be done, typing "RETURN" will reload the new accumulative recording from disk. This function is similar to rewind on a tape based recorder. The track display will then appear on the screen waiting for the next track to be selected for record or modification. To record additional tracks follow the same sequence as previously explained.

If no other tracks are to be added then typing "Q" for quit will route the system back to live mode. Before this happens though, the following prompt will appear:

"SAVE TRACK MASTER (Y/N)?"

Even though further mix-down work may be necessary, this prompt acts as a safeguard to save the current status of the track master. Typing "Y" followed by "RETURN" will allow saving the track master. Just typing "RETURN" moves the system on to live mode for mix-down of the Metatrak recording.

C. Erasing A Track

After recording several tracks you may decide to remove one completely from the accumulative recording. One quick way to accomplish a similar effect, is to zero out the volume parameter associated with the track. However, even though this removes the track's audio output, the track is still using up memory and occasionally using up oscillators that get assigned to it. If a track is no longer to be used, (as might be the case with a first "click" track recording), it is best to erase the track.

VII. Metatrak Recording Mode

Considering how tape based recorders work, it would seem the simplest way to erase a track is to re-record on it without giving any input. With Metatrak, once a track is recorded, the recording stays even if you record over it again. The reason behind this, is to make sound on sound recording possible on each individual track. So, to provide for complete removal of a track's recording, Metatrak includes an erase mode.

Any number of tracks can be set into erase mode by typing "E" after stepping to the "RSTAT" field of a track in the track master. Once set, the status "ERA" will flash on and off as a reminder that it is in erase mode. The actual erase requires going completely through the piece in Metatrak record mode and saving the track after termination. The tracks will stay in erase until reset to either play or record status. Play status can be reinstated by typing "P" after stepping to the "RSTAT" field in the track master. Erase will not affect a section of a track recording that was scanned through using the "fast forward" feature.

D. Punch-In / Punch-Out (ESC)

Being human and not a computer, we all make mistakes. Typically in the process of recording, the worst mistakes are at the end of an otherwise perfectly performed track. This is a form of "red light fever" which can be terminal to a musician in an expensive recording studio with an impatient producer hanging over him. With Metatrak it's not so bad, for like a recording studio, you have "punch-in/punch-out".

Punch-in/punch-out is an edit facility that allows selective erasing of unwanted portions of a recording. At the same time the old section is being erased, a new attempt can be made at recording it properly. Punch-in/punch-out is possible only in the Metatrak record mode.

To use punch-in/punch-out, set "RSTAT" to "REC" for the track to be worked on, (remember that re-recording over a track does not automatically erase it, but sets it up for sound on sound). Follow through the track master and record sequence until back in live mode listening to playback. When the portion to be removed approaches, type the "ESC" key once to punch-in. This will start the erase of the track. At this time the correction can be made. Notice that when punch-in active, the track number specified by "REC:" on the screen, will flash. To stop the erase, punch-out by again typing the "ESC" key.

Punch-in/punch-out can be used as many times through a recording as needed. After reaching the end of the recording it must be saved as with any new track recording. If it is not saved, the corrections made using punch-in/punch-out will be lost.

E. Fast Forward (F)

To speed up the process of adding to or correcting a recording, Metatrak provides a fast forward control. To set playback tracks into fast forward, type the "F" key. Doing this will speed playback up by eight times normal speed (800%). Fast forward provides the capability for "cueing" the playback of earlier tracks. To return to normal speed type "F" again. Fast forward will

not affect the resulting tempo of the recording as other speed of playback adjustments do. Please note, in Metatrak record mode fast forward will only work up until approximately 1500 notes (one half the total buffer size). Once this point is reached normal speed will automatically be resumed.

F. Restart (R)

If while recording a new track you make a mistake or just choose to start over you can instantly "restart" the piece by typing "R". In doing this, anything just recorded on the current track will be lost. The same general function can be accomplished by pressing the spacebar and specifying not to save the track, however, this requires a disk load which will take some time. Like fast forward restart will work up until half of the total possible number of notes played, approximately 1500 out of 3000.

G. Echo/Repeat

The echo/repeat feature allows sequencing of playback tracks while a new track is added. This is especially useful when laying down a first track such as a bass line that is to continue through the entire piece. Another application might be a background progression of several tracks that repeat while adding a lead line that varies throughout the piece.

The actual process is simple. Let's say you have just loaded a short meta file for Metatrak recording. After your track master is set for recording the next track and no further changes are to be made, you will encounter the prompt:

"ECHO/REPEAT (Y/N)?"

To set echo/repeat type "Y" followed by "RETURN". Just typing "RETURN" will turn echo/repeat off. After selecting echo/repeat the playback speed prompt will appear, for now, hit "RETURN".

At this point the first track should be playing back from beginning to end then, starting over again in a continuous sequence. While this is happening the new track can be added via the keyboard. To terminate the recording press the SPACEBAR. Once saved and listened to, you will notice that the new meta file is the cumulative result of the sequenced tracks and the new track.

Do not use the echo/repeat feature and metronome/click-track together while in Metatrak record mode; The recording will more than likely get out of sync. This is because the beginning and end termination points of an echo/repeat sequence, relative to the beat, are only as accurate as you originally recorded them. Considering most of us do not have millisecond accuracy in our hands, the timing is bound to be slightly off. This slight timing discrepancy can cause a noticeable timing error when repeated numerous times, as will occur when using echo/repeat.

See Appendix E for possible recording errors and warnings related to echo/repeat.

VII. Metatrak Recording Mode

H. Playback Speed Control < , >

Another useful feature in Metatrak recording is the playback speed control. With this unique feature, playback tracks can have their tempo modified while adding a new track at normal speed. All of this is done without changing pitch, as with conventional tape-based systems. For example, you can record an extremely complex piece at a slower tempo, then modify it for the correct speed. It can also be used for adjusting a piece to fit within a certain time limit or accelerating or retarding sections of a piece.

There are two methods of playback speed control; one is used for exact pre-specification of playback before recording, the other is used for gradual dynamic speed control during playback.

To preset the exact playback speed, set up the track master and start the recording sequence. After the echo/repeat prompt is answered, the following prompt will appear:

"PLAYBACK SPEED (1-800%):100"

The default upon "RETURN" is 100% (normal speed). To change, type in the desired playback percentage from 1 to 800%, followed by "RETURN", (Note: 200% is twice the speed, 400% is four times the speed and so on). After being entered the playback track should be heard at the altered speed while the new track can be recorded at a normal speed.

To terminate, either wait until the end of the piece, (if not in echo/repeat), or press the SPACEBAR. When listened to at normal playback speed (100%), the result should be the same as when in the recording process.

There are many ways to use this feature. In some cases, it may take a couple of recordings, with modified speed, to get the desired result. An example of this situation might be, adding an extremely fast lead line to a piece at normal tempo. This can be accomplished by recording the selection prior to the lead line at normal tempo. To add the fast lead line slow the playback of the earlier tracks down to, maybe, 50% (half speed). Once the lead line has been added and the meta file saved, go back into Metatrak recording and adjust the speed to 200%. Let the piece complete recording without adding anything and then save it. The result will have all tracks at normal speed except the lead line track which will be doubled saved in the final recording.

For gradual changes in playback speed, the "<" and ">" keys can be used during playback. Pressing the "<" key once lowers the playback speed by 5%. Pressing the ">" key raises playback speed by 5%. using these keys in conjunction with the "REPT" key will allow gradual speed transitions for "accelerando" or "ritardando". Once saved, the gradual speed changes will remain in the recording.

In either method of speed control, if you are going to use a very fast playback speed, make sure when originally recording, not to play notes too quickly. Extremely short notes that have been speeded up may seem to completely disappear. The particular envelope used also can have a big effect on the audible outcome of a recording played back at very fast speeds.

VIII. MIX-DOWN / PLAYBACK

In the conventional tape-based recording process, mix-down is the last major step before completion. In Metatrak, mix-down pertains to the reviewing process of a Metatrak recording and final adjustment of the track master before it is saved.

During Metatrak mix-down, instruments can be reassigned to different tracks, vibrato status set on or off, and most importantly, track volumes can be adjusted relative to one another. Granted, such functions can also be handled while in Metatrak recording, and in some cases should. However, the mix-down process tends to be more convenient, expedient and fail safe in standard playback.

There are various reasons why mix-down is best handled in standard playback. For one, tracks cannot be in record mode, alleviating the possibility of accidentally adding to a piece. Another reason is, the meta file doesn't have to be reloaded for each complete listening. This saves quite a lot of time when reviewing a recording numerous times. Also, playback speed can be dynamically incremented or decremented without modifying the final recording. This allows a controlled scanning through certain sections or adjusting for total time duration until satisfied with the results.

During mix-down/playback you may want to go back into Metatrak recording to modify a recorded piece. In fact, the two processes should be used interactively; using Metatrak recording primarily for adding or modifying track recordings and standard playback for periodic and final review for mix-down.

Exiting the Metatrak record mode will route the system back to live mode. Playback can then be selected by pressing the spacebar to get the record playback menu and typing "P" followed by three "RETURN"s.

A. The Track Master in Mix-Down/Playback

After selecting standard playback, the current track master will be displayed on the screen. At this point, changes to instrumentation, vibrato status or volume can be made for each individual track. Unless you are already aware of changes to be made, it is best to start playback to review the recording. To do this, type "RETURN" until playback starts.

If while listening to playback you find it necessary to make a change to the track master, type "CTRL-R". Doing this will display the track master and allow changes to be made. Altering the track master parameters is accomplished as explained in Standard Recording, section VI.

There are three main mix-down functions that should be adjusted as necessary during playback: instrumentation, vibrato state and track volume. The first of these to be finalized is instrumentation. Since each track recording is dependent only on the track number, any instrument in the preset master can be assigned to any given track. This also means a completely different preset master with ten new instruments can be loaded by typing "CTRL-P". If any single instrument in the preset master needs to be modified or completely replaced, this should be done using alphaPlus.

Once the instrumentation is finalized vibrato should be set. As explained in the track master section of this manual, one vibrato depth and rate is shared by all tracks. The vibrato used is that of the current keyboard (track 0) instrument. Applying vibrato to a track can be specified in the "VSTAT" field; a 1 = on, a 0 = off. Setting the global vibrato depth and rate is explained in Parameter Control, section III. Using vibrato on a given instrument is really up to your own listening discretion. Traditional orchestral instruments, (strings, brass), usually sound more realistic with vibrato, where as keyboard instruments, (piano, organ), usually are better off without it.

As explained in Parameter Control, section III, the "VOL" field specifies a volume limit that a track's instrument cannot exceed. The values can range from 255 (full on) to 0 (off). They also react differently if in linear or exponential envelope modes.

Setting "VOL" is done as explained in Standard Record Mode, section VI. Adjusting the volume of each track can have a great effect on the final outcome of a Metatrak recording. Proper usage of the volume control allows each track to be enhanced or subdued relative to the other.

An individual track volume remains as set throughout the entire recording. Variation of a volume for a single instrument part can be accomplished by re-recording on a new track the portion of the recording where the volume change is needed. Then the original section of the first track can be erased using the punch-in/punch-out feature. This allows the track volumes to be set as desired, having the same effect as changing volume during the recording.

In some cases you may want to completely eliminate a track. Turning the volume to 0 will audibly accomplish this. However, if the track is not going to be used, it should be erased. This is because the actual recording information is still being processed, and will affect voice allocation and meta file length.

B. Playback Reviewing <,>

It may take you several times through playback to properly mix down a recording. To speed up the process three playback speed controls are provided. Upon entering playback a speed control prompt will appear:

"ENTER PLAYBACK SPEED (1-800%):"

This prompt is handled exactly as in the Metatrak recording process. The only difference is that it won't permanently affect the recordings tempo. Typing "RETURN", without entering a value, causes a default to 100%, normal speed.

Once in playback two other methods of speed control can be used; a fast forward control and an incremental speed control. Fast forward, as in Metatrak recording, can be implemented by typing "F". Unlike Metatrak record mode, fast forward in standard playback can be used from beginning to end, regardless of the meta file length. The incremental speed control can be used by holding down the shift key and typing ">", causing a 5% speed increase. Applying the "<" key in the same fashion will decrease speed by 5%. Using either of these methods makes it possible to bypass sections not requiring further review or to slow down for sections needing attention.

If a recording needs to be reviewed many times there are three methods to re-start playback from the beginning of a piece. First, by pressing the SPACEBAR to select the record/playback menu and then typing "B" followed by "RETURN", the meta file "buffer pointer" will be reset to the beginning. Once the buffer is reset, playback can be re-started by hitting "RETURN". Another method is selecting "P" for playback again, re-starting the complete playback process. A third method, typing "E" for "ECHO", will cause playback to repeat automatically.

D. The Final Production (CTRL-D)

Once satisfied with all recorded tracks, the preset master and the track master, it is time to save the final production for later use. To do this both the meta file recording and its associated track master must be saved to disk. Use an extra disk for saving these files, it will help keep things organized. The recording can be saved as specified earlier in Standard Record Mode, section VI. The track master is saved as explained in The Recording Process, section V.

To provide a means of quick identification, it may help to name both the track master and recording with reference to the preset master that was used. For example, a track master named "JAZZ 1" using preset master "ALPHAPLUS" might be saved as "AP-JAZZ 1". The same goes for the associated meta file recording. Use whatever naming convention that works best for you, as long as names do not exceed fourteen characters. Relating file names will assure that the proper combination of track master, meta file recording and preset master will be loaded for playback at a later time.

In the final production stage you might want to clean up and organize the files on your diskette. To assist in this process, Metatrak provides access to standard Apple DOS commands by holding the "CTRL" key down and typing "D".

There are number of uses for DOS commands relative to Metatrak in the final production stage. For example, in the process of recording, files of various names may have been saved to disk. If these files are no longer needed they can be "deleted" from the disk using the DOS "DELETE" command. Besides deleting files you may want to fully protect your files from being accidentally written to by "locking" them using the DOS "LOCK" command. Another useful command is "RENAME". If you are not already familiar with these DOS commands see Appendix A and your Apple DOS manual.

IX. CONCLUSION

Well, if you have already successfully created a Metatrak recording or if you actually read this entire manual in preparation to do so, congratulations! From the descriptions and examples throughout this manual, it's easy to realize the value Metatrak offers to composers, arrangers, educators, recording studios, and musicians in general; and think, this is only the beginning! Metatrak will have even more features and performance power in future versions, further expanding your alphaSyntauri synthesizers capabilities.

If you have any comments or suggestions for future enhancements, write them down and send to Syntauri with your warranty card or in a separate letter. We at Syntauri want to develop the products you want, so let us know what you think.

Enjoy Metatrak, we're sure you'll find it an effective performance and recording tool for all your music efforts.

APPENDIX A: Disk and File Maintenance

There are many standard disk and file maintenance commands and programs that can be helpful when using your alphaSyntauri synthesizer and Metatrak software. If you are not already familiar with these commands or programs, the following is a brief description of how to use a few of them. For more information reference your Apple DOS manual.

Copying a Diskette

A back-up copy of your Metatrak diskette can be made via the copy program provided on your Apple DOS 3.3 diskette. To use this program; first boot the diskette until a basic prompt ("]") appears, then type, "RUN COPYA" followed by "RETURN". The program will ask you to define the slot and position of your disk drive(s) for source and destination. If you have only one disk drive the source and destination will be the same. Once set correctly, insert the disk you wish to copy.

Initializing a Diskette

A new blank diskette can be initialized for storing files by using the INIT command. The INIT command can be entered after booting your DOS 3.3 diskette. To initialize, put the new blank diskette into the disk drive, then type "INIT HELLO" followed by "RETURN". After the disk stops swirling and grunting, it will be initialized for use.

Deleting a File

To delete a file from diskette use the DELETE command. It can be used after booting your DOS 3.3 disk or during Metatrak by typing CTRL-D in Metatrak live mode. To delete a file simply type "DELETE" followed by the full name of the file you wish to delete, followed by "RETURN".

Other Commands and Programs

There are a number of other disk commands and programs you might find useful when working with the alphaSyntauri synthesizer. Some of these include: the "CATALOG", "RENAME", "LOCK" and "UNLOCK" commands, and the file copy program "FID". See your Apple DOS manuals for further information on these commands and programs.

APPENDIX B: Metatrak Command List

Here is a list of commands entered from the Apple Keyboard and a brief explanation of what they do. This list is meant for quick reference only. Refer to the appropriate sections of this manual for more detailed explanation.

E	Sets the envelope mode to exponential.
F	Fast forward (on/off toggle)
J	Move the split instrument pointer down by 1.
K	Move the split instrument pointer up by 1.
L	Sets the envelope mode to linear.
O	Turn the vibrato off.
R	Restart track record attempt (Metatrak record mode only)
U	Updates the video screen.
V	Sets the vibrato rate from paddle 0 and vibrato depth from paddle 1.
ESC	Record punch-in/punch-out (Metatrak record mode only).
<-	(left arrow) Lowers the system volume by 5.
->	(right arrow) Raises the system volume by 5.
<	Decreases playback speed by 5% in playback mode.
>	Increases playback speed by 5% in playback mode.
?	Display diskette catalog.
CTRL-B	Pitch bend on/off controlled by paddle 0.
CTRL-D	Access DOS commands
CTRL-F	Load an Fx mod (not compatible with alphaPlus FX mods)
CTRL-K	Include or exclude set-up program when you boot up.
CTRL-O	Change the offset (percussion channel tuning) in 32th tones.
CTRL-P	Load a Preset Master from diskette.
CTRL-R	Display track master for changes.
CTRL-S	Define, load or save a split keyboard definition.
CTRL-T	Load or save track master.
CTRL-V	Load a vibrato waveform from diskette and set vibrato rate and depth.
CTRL-Z	Set the metronome tempo (0 to 280 beats per minute).
0-9	Change an instrument (split dependent).
SPACEBAR	Access record/playback menu.

APPENDIX C: Metatrak File Type Descriptions

Below is a list of file types associated with Metatrak. Each file type is functionally described, and how its name appears on diskette is shown.

"PRESET MASTER: (name)"

A preset master is a file containing parameters for a bank of ten instruments created in alphaPlus. When loaded into the preset master, Metatrak uses "CTRL-P". It automatically loads the wave master file and LFO master file associated with it.

"WAVE MASTER: (name)"

A wave master file contains the waveforms for the ten instruments in a preset master. It is automatically loaded with its associated preset master.

"LFO MASTER: (name)"

An LFO master holds the vibrato and offset parameters of a preset master. It can only be created using an alphaPlus (version 2.0). The LFO master will automatically be loaded with its associated preset master. If a preset master that doesn't have an LFO master is loaded it will cause an error message, but will load the preset master properly.

"SPLIT MASTER: (name)"

A split master is a file that stores the number of splits and which instrument numbers are used in a split. The information is used for updating the screen. A split master can be loaded or saved using the "CTRL-S" command in Metatrak live mode. It automatically loads or saves a split bank file.

"SPLIT BANK: (name)"

A split bank file contains information for associating instrument numbers with key positions. It is automatically loaded or saved with a split master.

"TRACK MASTER: (name)"

A track master is a file that contains all the information for how the sixteen tracks in Metatrak were set in regards to instrument and control parameter assignment. A track master can be loaded or saved using the "CTRL-T" command in Metatrak live mode. It is meant to be used in conjunction with the preset master used in recording a meta file.

"META: (name)"

A meta file contains note and track information for a Metatrak recording. It can be loaded or saved in Metatrak via the record/playback menu.

"MFX: (name)"

A MFX file holds a Metatrak FX mod (special effect). An FX mod is a small assembly language program used for sound modification. FX mods can be loaded and saved using the "CTRL-F" command in live mode. The alphaPlus FX mods are not compatible with Metatrak.

APPENDIX C: Demonstration Recording Instructions

A Metatrak demonstration recording is provided on your Metatrak diskette. Listening to the recorded example will give you a quick idea of the possibilities and potential Metatrak offers.

There are a few steps to go through to prepare for proper playback. The explanation of each step is thorough for those who have not used the alphaSyntauri synthesizer before. Simply follow the instructions below. Detailed explanations for the process are covered in this manual.

STEP 1

Make sure you are in "live" mode, that is, you can hear sound as you play the alphaSyntauri keyboard and the diskette labeled Metatrak is in the disk drive.

STEP 2

If not already loaded, load preset master METATRAK.L, by holding down the "CTRL" key while typing "P", and then typing METATRAK.L followed by a "RETURN".

STEP 3

Once back in "live" mode, hold down the "CTRL" key while typing "T". A prompt for loading or saving a "track master" will appear; type "L" followed by "RETURN". Now type GALAXY GAP followed by "RETURN". This will load a track master, restoring Metatrak to the state it was in during the original recording.

STEP 4

When back in live mode again press the SPACEBAR. This will cause the record/playback menu to be displayed. Type "L" followed by "RETURN". This will allow you to load the metafile recording. Type GALAXY GAP followed by "RETURN".

STEP 5

The record/playback menu should reappear after the meta file is loaded from the disk. Type "P" followed by consecutive "RETURN"s until you hear the recording playback.

STEP 6

When the recording is finished, the screen will go back to the record/playback menu. Type "Q" followed by "RETURN" to turn the playback off. Typing "RETURN" again will put you back into the live mode

"Galaxy Gap" written, performed and copyrighted by: Robin J. Jigour

Since the meta file buffer is divided into two parts during the Metatrak recording, it is possible for the "track" being recorded to overwrite the playback "track". This may or may not be inconvenient depending on:

- * Whether or not the Echo/Repeat has been chosen.
- * The type of material being recorded from the alpha keyboard.

As a result, a number of safety checks have been included in the software to minimize these occurrences. Below is a brief discussion of each check and what it does.

Maximum Meta File Length

Each time a meta file is loaded in the Metatrak recording mode, the length of the file is checked before it is loaded. If the file when loaded, does not allow at least a 50 note difference between the beginning of the recording buffer and the playback buffer, an error message will be displayed on the video monitor, and the Meta file will not be loaded.

Buffer Collision Warning

When the meta file to be loaded meets the limits described above, the file is loaded and you may begin recording. The difference between the two buffer pointers is then monitored. If at any time a 200 note difference is violated, a flashing exclamation point will be displayed at the bottom right portion of the video screen to alert you to this fact. If you continue playing until the buffers finally overlap, you will exit the Metatrak record mode and be asked if you want to save the "track". If this happens save it as a different name so you still have the previous meta file to work with.

Echo/Repeat Shutoff

If you are using the Echo/Repeat option while in Metatrak record mode and you write over the beginning of the playback notes file because you ignored the buffer collision warning, the Echo/Repeat will stop automatically since that information has been written over during the recording process (when you reach the end of the playback meta file). You will exit the Metatrak record mode and be asked if you wish to save the track.

APPENDIX F: FX MOD DESCRIPTIONS

The following are descriptions of the Metatrak FX mods. A general explanation for using FX mods is covered in Parameter Control, section III. Note: Metatrak FX mods are not compatible with alphaPlus FX mods.

TS - Timbre Scan

TS scans through all the primary and percussion waveforms of the current preset master while using the envelope characteristics of the assigned instrument. The rate of the scan is controlled by adjusting paddle 0, and then pushing the paddle 0 button. Timbre scan can be assigned to a range of tracks when it is loaded. If no track range is specified it will affect tracks 0, (the live keyboard), through 8.

PS - Pitch Sweep

PS dynamically varies the pitch as controlled by the assigned instrument attack rate and position of paddle 1 when pushing the paddle 1 button. Special effects can be obtained by varying the control paddle until the pitch goes into or out of "aliasing". Pitch sweep, like timbre scan, can be assigned to a range of tracks.

AM - Amplitude Modulation

AM allows you to produce a tremolo effect with your master volume. The rate and depth are controlled by paddles 0 and 1, respectively. Use the paddle buttons to set the values. AM is a global FX mod for all tracks, a range cannot be defined.

VIB1 - Keyboard Following Vibrato

VIB1 emulates voltage-keyboard-follow control of analog synthesizers. The higher the key struck the faster the vibrato rate and the greater the vibrato depth. When using VIB1, vibrato cannot be updated by standard methods. VIB1 is a global FX mod for all tracks, a range cannot be defined.

OFF1 - Keyboard Following Offset

OFF1 works in the same fashion as VIB1, except that offset is affected rather than vibrato. The higher the key struck, the greater the offset detuning between the primary and percussion oscillators. OFF1 is a global FX mod for all tracks, a range cannot be defined.



symposium corporation • 3100 waverly street • mpls, mn 55405 usa